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AUTHORITY	
APGC ltr dtd 1 Jul 1954; HQ AFMC/SCDP ltr dtd 23 Jun 2000	

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AD-B180 373



REPORT
OF

THE AIR PROVING
GROUND COMMAND

EGLIN FIELD, FLORIDA

DTIC

ELECTE

FEB 8 1964

TESTS CONDUCTED BY

"DTIC USERS ONLY"

AAF PROVING GROUND

EGLIN FIELD, FLORIDA

SUBJECT

PRELIMINARY REPORT ON TEST OF CRANES AND TRANSPORT EQUIPMENT
TO HANDLE HEAVY BOMBS

PROJECT No.

3-45-34 ⁴⁵⁸² E4852-

DATE

4 October 1946

Cancelled
"Classification changed per Authority Letter Dated 3/16/54"

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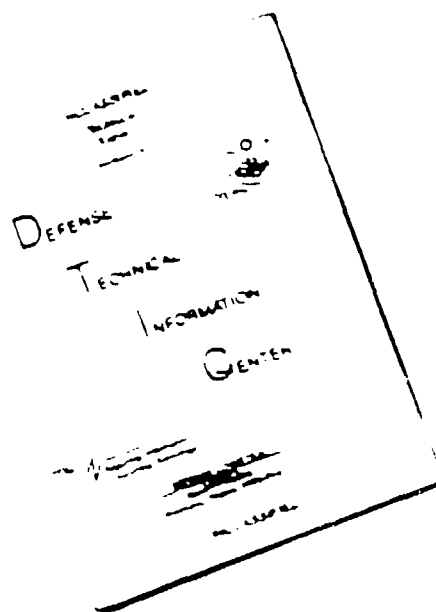
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HEADQUARTERS
AIR PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

4 October 1946

PROJECT NO. 3-45-34

PRELIMINARY REPORT ON TEST OF CRANES AND TRANSPORT EQUIPMENT
TO HANDLE HEAVY BOMBS

1. Inclosed is copy of preliminary report of Air Proving Ground Command, Eglin Field, Florida, subject as above.
2. This project was initiated at the request of the AAF Board, Orlando, Florida, in letter dated 16 April 1945, and Headquarters, AAF, in letter dated 7 June 1945.
3. Object.—To determine:
- a. The suitability and capabilities of standard military vehicles for hauling, handling and loading 12,000 and 22,000-pound bombs for aircraft.
 - b. The most suitable types of standard and special military vehicles that can be used to accomplish this work, with suitable techniques for handling the equipment and bombs.
4. Purpose of test equipment: To haul, handle and load 12,000 and 22,000-pound bombs for aircraft.
5. Description: The following items of equipment were utilized in this test:
- a. Standard ~~air corps~~ full, flat-bed, 20-ton trailer.
 - b. Ordnance prime mover (White), 6-ton, 6x6.
 - c. Experimental Boeing wishbone type trailer.
 - d. Experimental track and dolly set designed by APGC Ordnance Department.
 - e. Lorain 20-ton, M-2, 6x6 truck-mounted crane.
 - f. Autocar, truck tractor, 4 to 5-ton, 4x4.
6. Conclusions:
- a. The experimental Boeing wishbone type trailer is the most suitable of the equipment tested for satisfactorily transporting, as well as loading, 12,000 and 22,000-pound bombs for B-29 aircraft.

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b. The Lorain 20-ton, M-2, 6x6 truck-mounted crane, the Autocar, truck tractor, 4 to 5-ton, 4x4, and the standard Air Corps full, flat-bed, 20-ton trailer are the most suitable of the standard equipment tested for hauling and handling 12,000 and 22,000-pound bombs.

7. Recommendations:

a. The experimental Boeing wishbone type trailer be issued to squadrons handling 12,000 and 22,000-pound bombs.

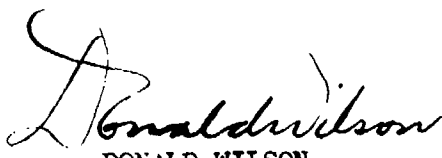
b. The Lorain 20-ton, M-2, 6x6 truck-mounted crane, the Autocar, truck tractor, 4 to 5-ton, 4x4, the standard Air Corps full, flat-bed, 20-ton trailer, and the special low-clearance trailer (see Inclosure 5, Page 1, Preliminary Report) designed by this command be issued to squadrons handling only the 12,000-pound bombs.

8. This equipment was tested only under temperate climatic conditions.

9. Inclosures:

Inclosure 1 - Test Directive.

Inclosure 2 - Preliminary Report (3-45-34)


DONALD WILSON,
Major General, U.S.A.,
Commanding.

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JRVD/CNH/eb-F
16 April 1945

Test of Cranes and Transport Equipment to Handle
Heavy Bombs. AAF Board Project No. F-4582.

Armament Division

TO: Commanding General, AAF Proving Ground Command,
Eglin Field, Florida. (Attention: Proof Division).

1. The AAF Board requests that test of cranes and transport equipment be conducted by the AAF Proving Ground Command.
2. It is believed that existing equipment can be satisfactorily adapted to handle the Tall Boy Medium, 12,000 lb.; Tall Boy (Grand Slam) 22,000 lb.; and T12, 42,000 lb. Bombs. Since it is anticipated that all three types of bombs will be handled only at Very Heavy Bomber Air Bases, the equipment capable of handling the heaviest bomb will at times be utilized for the lighter types.
3. The Chief of Ordnance has been requested to determine the most suitable of the existing types of cranes, trailers, and prime movers. One each of the selected types will be shipped to Army Air Forces Proving Ground Command, Eglin Field, Attention: Proof Division, for tests in handling the above bombs.
4. One (1) Crane, Truck-Mounted, 20-Ton Capacity, with 30-foot Boom, will be shipped within the next ten days. One (1) trailer and one (1) prime mover will follow at a later date.
5. It is desired that the equipment supplied be tested in handling of the three types and the usual reports rendered.
 - a. Determine the suitability of each crane, trailer and prime mover.
 - b. Submit recommendations on changes, or modifications, to the types supplied, or recommendations on types which may be more suitable.
 - c. Submit recommendations on the basis of issue.
6. The AAF Board has assigned this test the AAF Board Project No. F-4582, and has designated Captain Hagar as the AAF Board Project Officer for this test.

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Ltr to CG, AFPGC, dtd 16 Apr 45, subj "Test of Cranes and Transport Equip. to Handle Heavy Bombs. AAF Bd. Proj. No. F-4582.

7. This project has been given Second Priority, and classified Secret.

8. In the preparation of the test program, any test requirements, in addition to those submitted herein, deemed necessary for the performance of the test, are authorized.

FOR THE PRESIDENT:

/s/ Wm. W. Momyer
/t/ WM. W. MOMYER
Colonel, Air Corps
Executive

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7 Jun 1945

AAF 451.20 (31 May 45)

SUBJECT: Test of Handling Equipment for Bomb, G.P., 12,000 lb., T10
and Bomb G.P., 22,000 lb., T14

TO: President, Army Air Forces Board, Orlando, Florida

1. Reference is made to letter from Commanding General, Army Air Forces to Commanding General, Army Service Forces, File Reference AAF 451.20, dated 10 May 1945, subject: "Dolly and Track Sets for Heavy Bombs," Restricted, and to letter from Commanding General, Army Air Forces, to Commanding General, Army Service Forces, File Reference AAF 451.36, dated 28 May 1945, subject: "Trailer, Bomb Delivery Type for Bomb, G.P., 12,000 lb., T10," Confidential, requesting development of referenced subject equipment; copies of which were forwarded to your office. Reference is also made to letter from Commanding General, Army Air Forces, to President, Army Air Forces Board, File Reference AAF 451.20, dated 11 April 1945, subject: "Test of Cranes and Transport Equipment to Handle Heavy Bombs," which directed the test of equipment supplied to Eglin Field for handling heavy bombs.

2. The Office, Chief of Ordnance is expediting development of a track and dolly set at Aberdeen Proving Ground, Aberdeen, Maryland, which is scheduled for completion within the next ten days. This set will be designed to accommodate the 12,000 and 22,000 lb. bombs for delivery in hoisting position under bomb bay of B-29 Aircraft. A shallow pit will be required to use this set, which may prove a more desirable method than the deep pit now under consideration. Arrangements will be made to ship this equipment by Air from Aberdeen to Eglin Field.

3. Mr. C. C. Dowd, Development Engineer, Office, Chief of Ordnance, Detroit, will accompany the equipment to Eglin Field, in order that modifications, if any, may be effected immediately, and in the event this equipment is recommended for issue, sufficient information may be gained to enable immediate placing of contracts for production.

4. A Bomb Delivery Type Trailer similar to the trailer constructed at Eglin Field for delivery of the 12,000 lb. bomb to hoisting position under bomb bay of B-29 is also under development for completion at the earliest possible date, in order that limited quantities may be supplied for initial operations.

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Ltr to President, AAF Board, dtd 31 May 45, subject: "Test of Handling Equipment for Bomb G.P., 12,000 lb., T10 and Bomb, G.P., 22,000 lb., T14" Continued

5. Lt. Col. E. H. Holtzkemper, Chief of Vehicle Development Branch, Office, Chief of Ordnance, Detroit, and Captain M. E. Wickersham, Development Project Officer, will visit Eglin Field for additional information relative to design detail of this trailer. This trailer, when completed, will also be shipped to Army Air Forces Proving Ground Command, Eglin Field, Attention: Transportation Officer, Marked for: Ordnance Property Officer.

6. It is desired that both types of bomb handling equipment be tested and results informally transmitted to this Headquarters by telephone which may be confirmed by formal reports of test.

a. Determine the suitability of both types of equipment for the delivery of bombs under bomb bay of B-29 Aircraft.

b. Submit recommendations on changes or modifications of the types supplied for test together with recommendations on types which may be considered more suitable.

c. Submit recommendations on basis of issue.

7. This project is considered to warrant assignment in First Priority as a supplement to Project F 4582.

By command of General ARNOLD:

s/ William F. McKee

WILLIAM F. MCKEE
Brig. General, U.S. Army,
Acting Chief of Air Staff
Operations, Commitments & Requirements

COPY

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HEADQUARTERS
AIR PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

PRELIMINARY REPORT

ON

TEST OF CRANES AND TRANSPORT EQUIPMENT TO HANDLE HEAVY BOMBS

PROJECT NO. 3-45-34

Inclosure 2

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1. OBJECT.--To determine:

a. The suitability of standard military vehicles for hauling, handling and loading 12,000 and 22,000-pound bombs for aircraft.

b. The most suitable types of standard and special military vehicles that can be used to accomplish this work, with suitable techniques for handling the equipment and bombs.

2. INTRODUCTION:

Description.--One 20-ton capacity, Type M2, Lorain mobile crane (see Inclosure 3A and 3B), two 22-ton low-bed trailers (see Inclosure 7C), one 6-ton, 6x6 prime mover (see Inclosure 7A), one 5 to 6-ton, 4x4 tractor truck with winch (see Inclosure 8A), and a track and dolly loading system (see Inclosure 4A and 4B) were received for test. A low clearance special trailer (see Inclosure 5A and 5B) was designed at this station. Standard AAF tractor and trailer unit combination of semi-trailer, 25-foot, type C-2, 12-1/2-ton capacity with truck trailer, 4 to 5-ton, 4x4 prime mover, was also considered (see Inclosure 9A and 9B). A hydraulic lift type dolly designed by Boeing Airplane Company, hereinafter referred to as Boeing trailer, was also used (see Inclosure 13A and 13B). The Boeing trailer is of tubular and plate welded steel construction and is mounted on three solid rubber-tired wheels. Hoisting facilities are built into the frame and a bomb cradle is provided for transporting the bombs. Bombs are hoisted by a double chain sling suspended between hydraulically-operated arms (see Inclosure 13B and 13C), one arm being mounted on each side of the frame. The arms may be raised either together or individually, each having its own hydraulic pump and piston mounted on each side of the frame. This permits rotation of the bomb for adjustment in mounting. The dolly is so constructed that it may be dismantled for shipment.

3. CONCLUSIONS:

a. The 20-ton capacity, type M2, mobile Lorain crane, the 4 to 5-ton Autocar or Federal tractor truck with the 25-foot, 25,000-pound capacity, C-2 semi-trailer are suitable for AAF use for handling and hauling the 12,000 and 22,000-pound bombs.

b. The Boeing trailer is the most suitable of the equipment furnished for satisfactorily placing the 12,000 and 22,000-pound bombs into the airplane or to wing racks of B-29 aircraft.

c. For squadrons handling only the 12,000-pound bombs, the equipment mentioned in paragraph a. above, supplemented by a low-bed, special trailer (see Inclosure 5A and 5B) is most satisfactory, as loading by this equipment can be accomplished on any hard surface.

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4. RECOMMENDATIONS:

a. Trailers, similar to the trailer designed at this station, M-2 mobile Lorain cranes, 4 to 5-ton Autocar or Federal tractor trucks, and C-2, 25-foot, 25,000-pound semi-trailers, be issued to squadrons handling only the 12,000-pound bomb.

b. For squadrons using 12,000 and 22,000-pound bombs, the use of the Boeing trailer is recommended. (See Inclosure 13.)

c. Two each lifting bars and slings of the type discussed in paragraph 6 h. be issued with each Boeing trailer.

5. RECORD OF TEST:

This test was conducted in accordance with the Test Program, dated 17 May 1945, copy appended as Inclosure 2. Additional tests conducted on the track and dolly unit and the 12,000-pound trailer were requested in letter, Headquarters AAF, dated 7 June 1945, to the President, AAF Board, Orlando, Florida, subject, "Test of Handling Equipment for Bomb, G.P., 12,000-lb., T-10, and Bomb, G.P., 22,000-lb., T-14." (See paragraph 1, Inclosure 1.)

6. DISCUSSION:

a. Prior to the arrival of the Boeing lift at this station, in an effort to satisfactorily load these bombs, the following method was used. A 6-ton, 6x6 prime mover, a 22-ton, low-bed full trailer, a 5 to 6-ton, 4x4 tractor truck, and a 22-ton, low-bed semi-trailer, and the M-2 mobile crane were received and inspected. A pit behind a dispersal area was constructed deep enough to allow a standard trailer carrying a bomb to back into it. The side-walls were made of iron-reinforced concrete and the floor was Pierced-Plank steel landing mat for drainage purposes. The pit was 5 feet deep, 12 feet wide, and 40 feet long. The access road of Pierced Plank was level with the floor of the pit for an additional 40 feet; an incline of approximately 10 per cent then led to ground level (see Inclosure 6A, 6B and 6C). Using this method, the 6x6 prime mover with the full trailer was unsatisfactory because of the poor backing characteristics of this type truck-and-trailer combination. (See Inclosure 7B.) The 4x4 tractor truck and semi-trailer were then tried. An attempt was made to load a 22,000-pound bomb from this trailer; the trailer bed was too short to handle the bomb, for the bomb extended over the rear of the trailer bed approximately four feet. This made the trailer dangerous to handle on rough roads. Moreover, the bed of the trailer had a drop of 5 inches from front to rear. (See Inclosure 8.) This placed the bomb at an angle to the bomb bay which made it difficult to place the slings in the correct position and load. When backing the unit into the pit with the airplane in place over the pit, clearance between the tail end of the airplane and the ground was insufficient for the 5 to 6-ton prime mover

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to back under it. This difficulty could be overcome by furnishing this prime mover with a collapsible canvas top, if necessary to use in place of 4 to 5-ton prime mover.

b. A standard 4 to 5-ton, 4x4 Autocar tractor truck and a 25-foot, 25,000-pound, C-2 semi-trailer were then tested. This unit had sufficient weight capacity and length of trailer bed, and was sufficiently level when loaded to be satisfactory for loading either the 12,000 or 22,000-pound bombs by means of the 5-foot pit. The original shipping cradle for the bomb was placed in position on the bed of the trailer, the lifting slings were placed in position on the cradle, and the bomb was positioned and centered. Loading into the bomb bay was accomplished by means of the standard chain falls supplied with the airplane. (See Inclosures 12A and 12B.)

c. The M-2 mobile crane was used in all loading operations and was satisfactory for handling both bombs. This crane, with radius great enough to accomplish loading on the trailers, was being used to its maximum ability. During all phases of operation, the outriggers should be used to allow maximum lift over the rear and sides of the truck and afford more safety. (See Inclosure 10A and 10B.) An experienced operator is a definite requirement when the crane is being used for handling these bombs. Chocking of the bomb should be accomplished prior to movement on any trailer.

d. A test was run to determine whether the crane had sufficient capacity to lift and handle a bomb weighing 40,000 pounds. At a 14-foot radius, the crane was barely able to lift the weight from the ground, but was not able to swing it into position for loading on a trailer. This crane cannot be considered satisfactory for future heavier bomb handling. (See Inclosure 11A and 11B.)

e. For squadrons handling only the 12,000-pound bomb, the 4 to 5-ton Autocar or Federal tractor truck, the 25-foot, 25,000-pound, C-2 semi-trailer, and the M-2 mobile crane, supplemented with a specially-designed low-clearance trailer, can be used on hard surface without the aid of a pit. There is sufficient clearance to load this bomb assembled and in place on the special trailer by hand pushing it under the bomb bay from the rear of the airplane. This system would not require a special loading place. There is not sufficient clearance to load the 22,000-pound bomb; the outside diameter of the bomb is greater than the clearance between the ground and the bulkhead at the rear bomb bay.

f. The track and dolly system devised by Office, Chief of Ordnance, Detroit, is not considered as suitable as the Boeing trailer, although this system can be used for either bomb without making changes in the slings or in the dolly. The track is fabricated in 8-foot lengths.

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Each track is formed of two sections of angle iron welded together on top of a length of hand iron. (See Inclosure 4.) To form correct gage and provide flotation, these tracks are fastened to plywood platforms. One hundred feet of this track must be furnished to extend from under the bomb bay to beyond the rear of the tail to allow loading of the bomb from a trailer to the dolly without interference from the fuselage. The dolly is a 4-wheel tubular frame assembly with two removable slings held in position by guide plates. The slings are mounted on double-row roller bearings, to allow a sideward motion of approximately four inches when loading the bomb. Two roller bearings are mounted in each sling to allow the bomb to be rotated so as to align the centering guide hold on the top of the bomb. These slings become the lifting slings when the bomb is in position under the bomb bay. For loading, the chain hoists issued with the airplane are fastened to the slings. (See Inclosure 12.) This equipment, when supplemented by the equipment listed in paragraph 3 a., forms the safest and most practical working unit for loading these heavy bombs, other than the Boeing trailer. (See Inclosure 4A and 4B.) With this equipment a pit is required but need be only 12 inches deep for 22,000-pound bombs. The following changes in the track and dolly equipment are recommended before standardization is effected.

- (1) Bind the edges of the plywood platforms with metal strips to prevent cracking and warping.
- (2) Devise a better method of joining the sections of track together.
- (3) Install towing hooks on both ends of the dolly to facilitate towing.
- (4) Move the lifting points on the slings outward to the distance that is now standard on the slings supplied with the airplane. This will allow a straight lift from the slings to the frame in the airplane.

g. The original Boeing trailer as received at this station was not satisfactory; a teletype was sent to OC&R, Washington, D.C., recommending necessary modifications. The modified trailer was received and was somewhat more satisfactory, although the trailer did not incorporate all the changes recommended. (See Inclosure 15.) Due to nonavailability of a modified B-29 airplane at this station, the new Boeing trailer was not tested for placement of bombs into aircraft; however, results gained from first test were believed conclusive. An additional lift of 10 inches was incorporated into the modified trailer which should make it satisfactory. For wing loading of B-29's with either the 12,000 or 22,000-pound bombs, the unit may be operated on

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regular hardstand surfaces. For internal loading, a concrete pit, 16 inches deep, 9 feet wide, and 50 feet long, with a ramp on both ends was needed. The ramp in the rear is required for entry of bomb trailer, while the ramp on the front is required to remove trailer after loading.

h. Initially, the 12,000 and 22,000-pound bombs were lifted by encircling the bombs with a 3/4-inch wire rope. (See Inclosure 10A.) This method, although satisfactory, was not considered safe. Two different types of lifting bars were designed by this station. (See Inclosure 14A and 14B.) Of the two designed, the V-type which weighs 184 pounds is considered more satisfactory, although it is too heavy. The V-type is attached by pins to a roller chain with a high safety factor which grasps the bomb tight enough to prevent slippage. A bar and sling assembly of this general plan should be manufactured, tested, and, if approved, issued on the basis of two each per Boeing trailer, with chain lengths for both 12,000 and 22,000-pound bombs.

7. INCLOSURES:

- Inclosure 1 - Test Historical Data.
- Inclosure 2 - Test Program.
- Inclosure 3 - Photographs.
- Inclosure 4 - Photographs.
- Inclosure 5 - Photographs.
- Inclosure 6 - Photographs.
- Inclosure 7 - Photographs.
- Inclosure 8 - Photographs.
- Inclosure 9 - Photographs.
- Inclosure 10- Photographs.
- Inclosure 11- Photographs.
- Inclosure 12- Photographs.
- Inclosure 13- Photographs.
- Inclosure 14- Photographs.
- Inclosure 15- Cy of Telegram to CG AAF

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Prepared by: P. A. Knobloch
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Consulted in: Stanley H. Hassett
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Approved by: Lloyd H. Watnee
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AC/S, A-3.

Approved by: Donald Wilson
DONALD WILSON,
Major General, U.S.A.,
Commanding.

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INCLOSURE 1
TEST HISTORICAL DATA

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TEST HISTORICAL DATA

1. INTRODUCTION:

Authorization.---This test was requested in letter from the AAF Board, Orlando, Florida, dated 16 April 1945, and letter from Headquarters AAF, dated 7 June 1945.

- 2. ACTIVATION DATE: 5 May 1945
- 3. EQUIPMENT RECEIVED: 15 May 1945
- 4. SUSPENSION DATE: 13 August 1945.

Reason: Awaiting arrival of equipment for 42,000-pound bombs. In June 1946, it was decided to break the test into three phases: preliminary phase for the 12,000 and 22,000-pound bombs; intermediate phase for the 42,000-pound bombs; and final phase for the 80,000-pound bombs.

- 5. GROUND HOURS: 1,000
- 6. FLYING HOURS: None
- 7. RELATED TESTS: None
- 8. This equipment was tested only under temperate climatic conditions.
- 9. A 35mm movie showing the handling and loading of the 12,000 and 22,000-pound bombs with standard equipment is available at APGC, Eglin Field, Florida.

Inclosure 1.

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INCLOSURE 2
TEST PROGRAM

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PROOF DIVISION
ARMY AIR FORCES PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

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By authority
of CG, AFPGC
5-12-45 JEC

17 May 1945

SUBJECT: Program for Test of Cranes and Transport Equipment to Handle Heavy Bombs. (S.T. 3-45-34) AAF Board Project No. F4582.

TO: Command Ordnance Officer, AFPGC, Eglin Field, Florida.

1. GENERAL:

a. Description.—One 20-ton capacity Lorain mobile crane and two 22-ton low-bed trailers -- one equipped with a 6-ton 6x6 prime mover and one equipped with a 5 to 6-ton 4x4 truck tractor with winch -- are being shipped by the Chief of Air Ordnance, Washington, D.C. to this station to test their application for use in the handling, hauling, and loading of 12,000 and 22,000-pound bombs for very heavy bombardment aircraft.

b. PRIORITY: 1st

c. Project Officer: Captain J. D. Fina.

d. Assistant Project Officer: Lt. Howard Zimmerman.

e. Ordnance Test Officer: Captain J. O. Cron.

2. OBJECT.—To determine:

a. The suitability of standard military vehicles for hauling, handling and loading 12,000 and 22,000-pound bombs for aircraft.

b. The most suitable types of standard military vehicles that can be used to accomplish this work with suitable techniques for handling the equipment and bombs.

3. METHOD OF CONDUCTING TEST:

a. The equipment will be inspected, serviced and photographed.

C O P Y

Inclosure 2, Page 1.

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b. Data pertinent to each type of vehicle will be tabulated and put in record form for inclusion in the Final Report.

c. The equipment will be issued to the Ordnance Section of the Proving Ground Command, which will maintain and operate it during the test period.

- (1) The crane will be used in all routine handling of the 12,000 and 22,000-pound bombs to determine its limitations in lifting and swinging bombs of these weights.
- (2) The tractors and trailers will be used in all routine hauling that is required to bring the bombs from the rail depot, wharf or magazine area to the airplane. Capacity loads of unassembled bombs and tail sections will be determined when hauling from rail depots and wharfs to bomb dispersal areas.
- (3) Methods of loading assembled bombs on the trailers for direct delivery to the bomb bays of very heavy bombardment aircraft will be determined and tested.
- (4) Additional tests on the standard equipment, deemed necessary by the Project and Test Officers for the completion of the test, are authorized.

4. RECORDS:

a. General characteristic sheets will be drawn up and completed. These sheets will be appended as Inclosures to the Final Report.

b. Photographs will be taken of the equipment in use.

c. A daily log will be maintained by the Test Officer throughout the test period.

BY COMMAND OF BRIGADIER GENERAL GARDNER:

s/ Alvin E. Hebert, Col AC
for LLOYD H. WATNEE,
Colonel, Air Corps,
Director, Proof Division.

Inclosure 2, Page 2.

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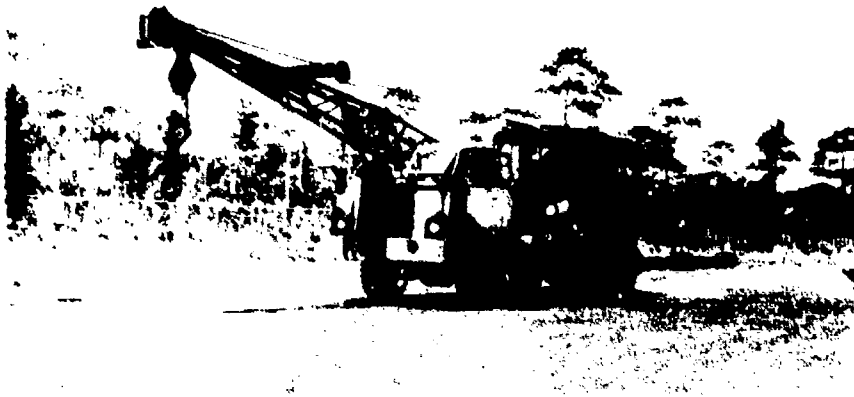
INCLOSURES 3 - 14

PHOTOGRAPHS

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A. The M-2 mobile crane with boom in stowed position for road travel.



B. Rear view showing crane power unit. This unit is on a geared turntable.

Inclosure 3, Page 1.

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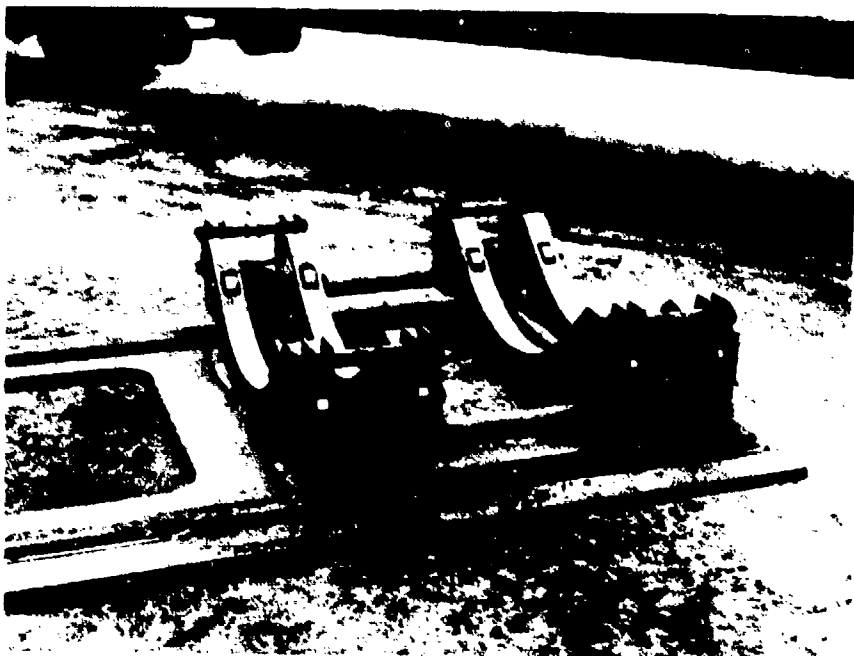
- C. The 4 to 5-ton Autocar tractor truck, and the 25-foot, 25,000-pound capacity, C-2 semi-trailer with 22,000-pound bomb.

Inclosure 3, Page 2.

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- A. Close-up of the track and dolly unit. Slings are removable from the carriage when the bomb is lifted into the airplane.

Inclosure 4, Page 1.

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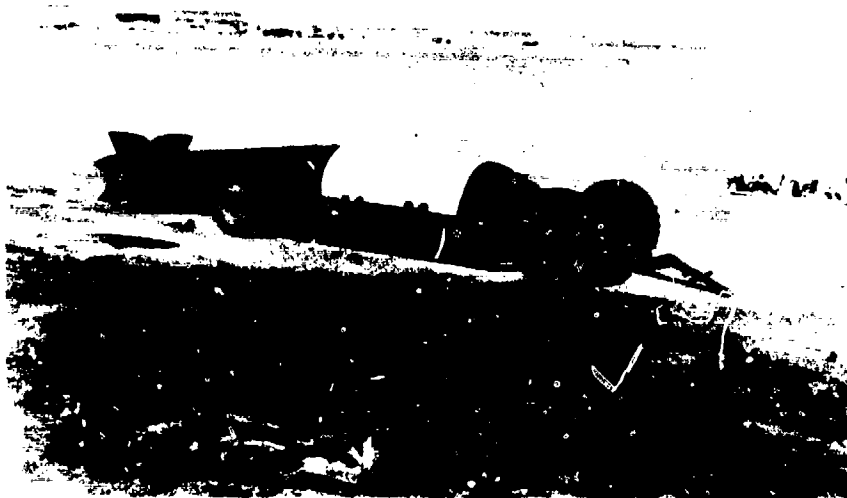
B. View of the pit and track and dolly unit with a 22,000-pound bomb loaded on the unit. This pit is necessary due to the clearance at the rear of the B-29 airplane bomb bay.

Inclosure 4, Page 2.

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A. Side view of the specially-built trailer with 12,000-pound bomb in cradle.

Inclosure 5, Page 1.

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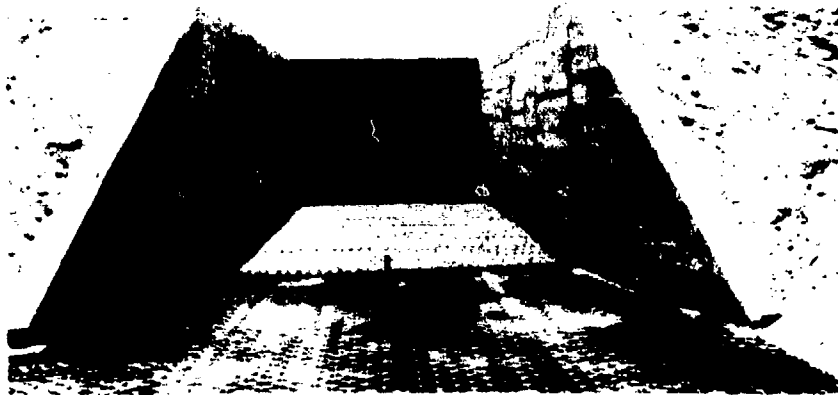
B. Rear top view of bomb on cradle in trailer.

Inclosure 5, Page 2.

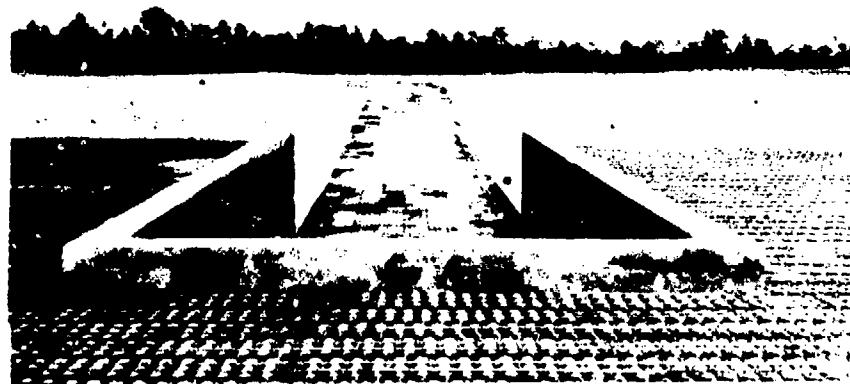
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A. Deep pit constructed for direct loading of bombs
from the C-2 semi-trailer.



B. Top view of the pit showing access road.

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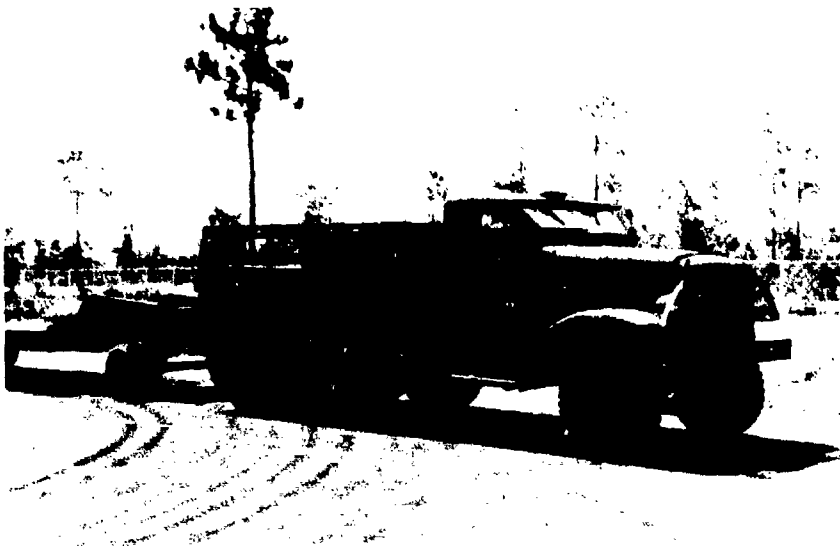
C. Side top view of pit showing landing mat next to sides of pit to support the main landing gear wheels of the B-29 airplane.

Inclosure 6, Page 2.

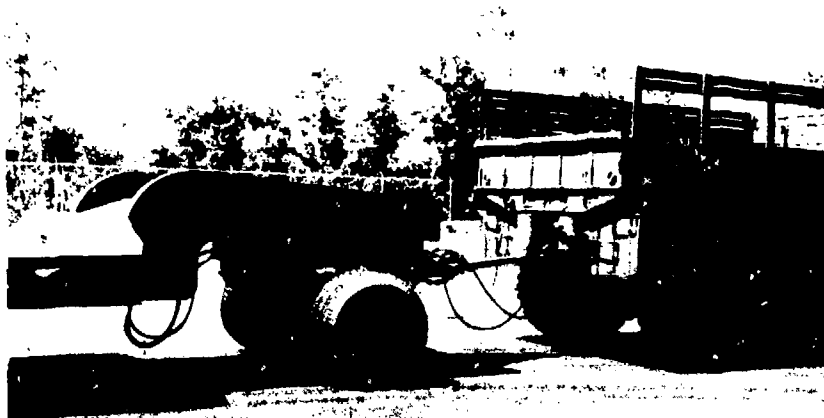
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A. The 6-ton, 6x6 prime mover.



B. View showing trailer dolly and method of attaching trailer to the prime mover. This type of truck and trailer combination is difficult to back with any amount of accuracy.

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- C. The 22-ton flat-bed full trailer. This trailer is not level and does not afford a good platform for direct loading of either bomb.

Inclosure 7, Page 2.

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A. The 5 to 6-ton, 4x4 tractor truck and 22-ton low-bed semi-trailer.



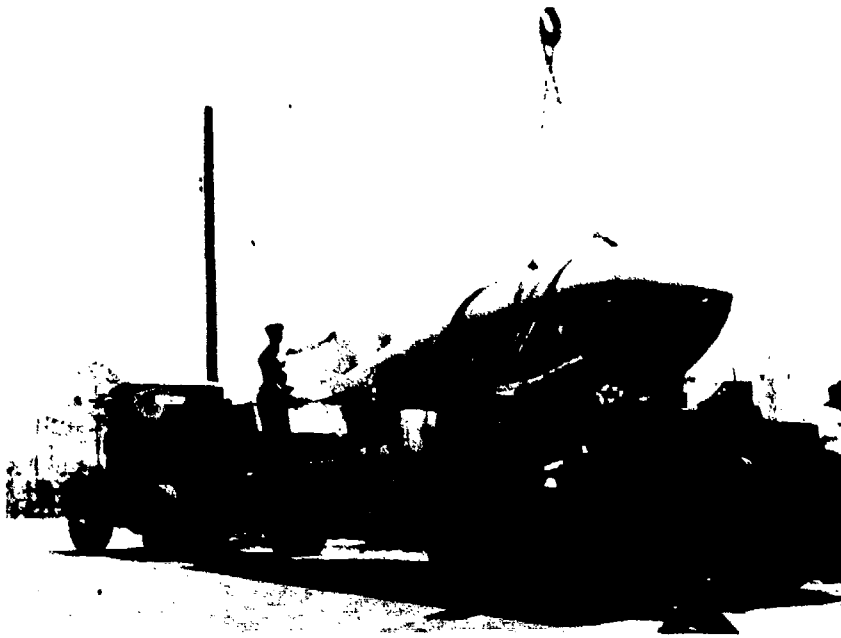
B. The bed of the trailer is placed at an excessive slant because of the difference in sizes of tires on the trailer and tractor.

Inclosure 8.

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A. A 22,000-pound bomb being placed on shipping cradle on C-2 flat-bed prior to loading into the airplane.



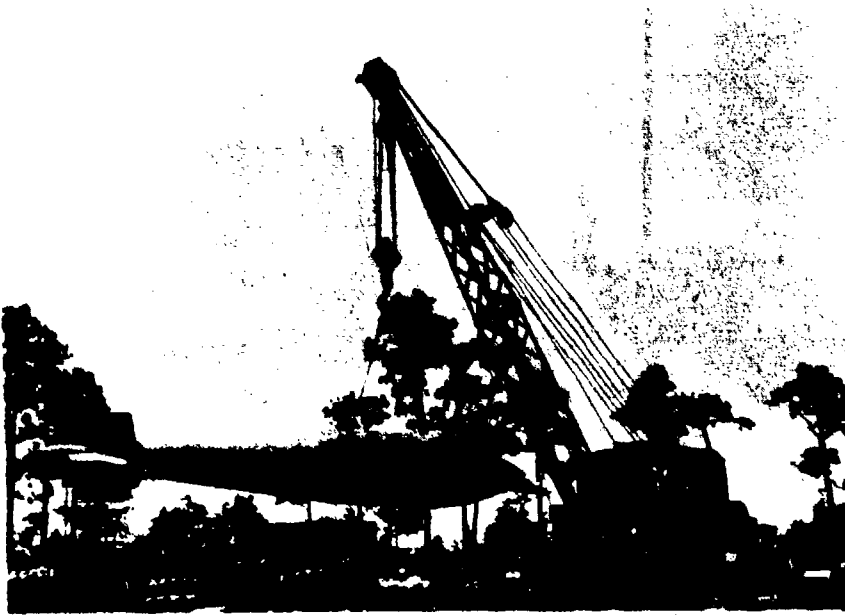
B. A 22,000-pound bomb on the 4 to 5-ton Autocar and C-2 semi-trailer combination prior to delivery of bomb to the pit for loading.

Inclosure 9.

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- A. The M-2 mobile crane handling the 22,000-pound bomb. The boom is in its normal position for handling a bomb of this weight.

Inclosure 10, Page 1.

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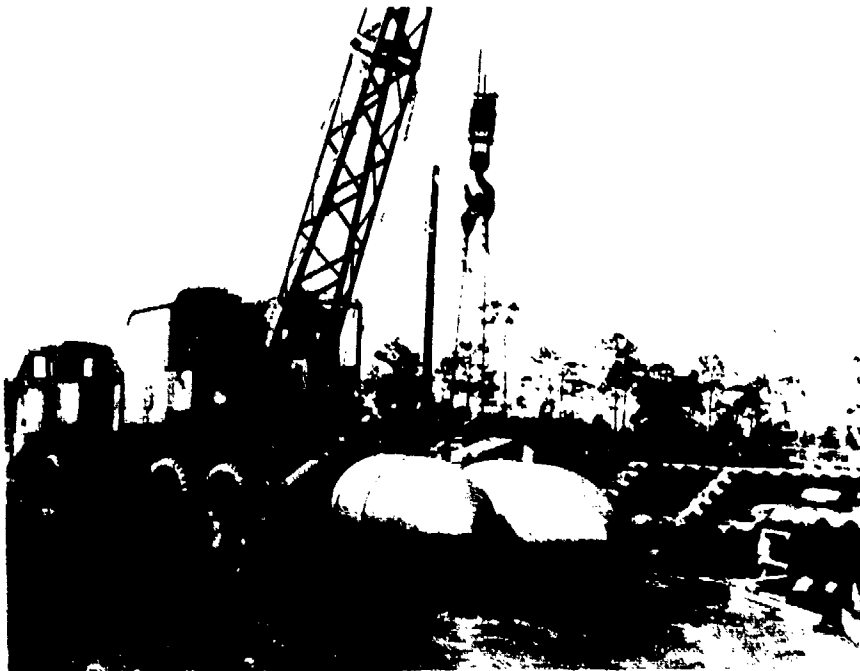
- B. Note outriggers on bumper of crane. These must be used when handling even the 12,000-pound bomb.

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- A. The crane in maximum lift position with two 22,000-pound bombs without fins. Total weight - approximately 43,000 pounds.

Inclosure 11, Page 1.

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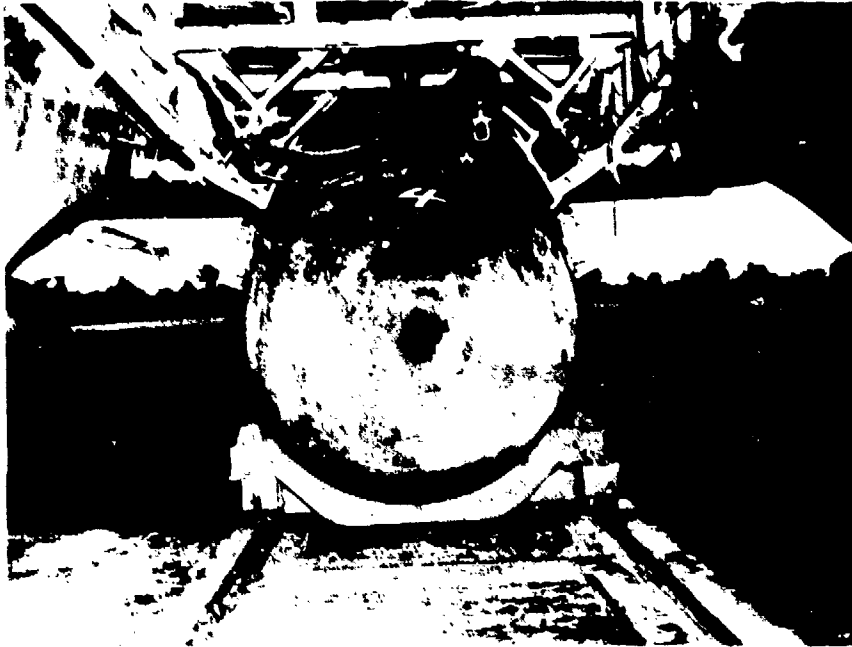
- B. While the crane had sufficient power to lift this weight, it could not swing it to load it on a trailer. The lift point was too close to the tractor unit to be satisfactory in handling bombs larger than the 22,000-pound type.

Inclosure 11, Page 2.

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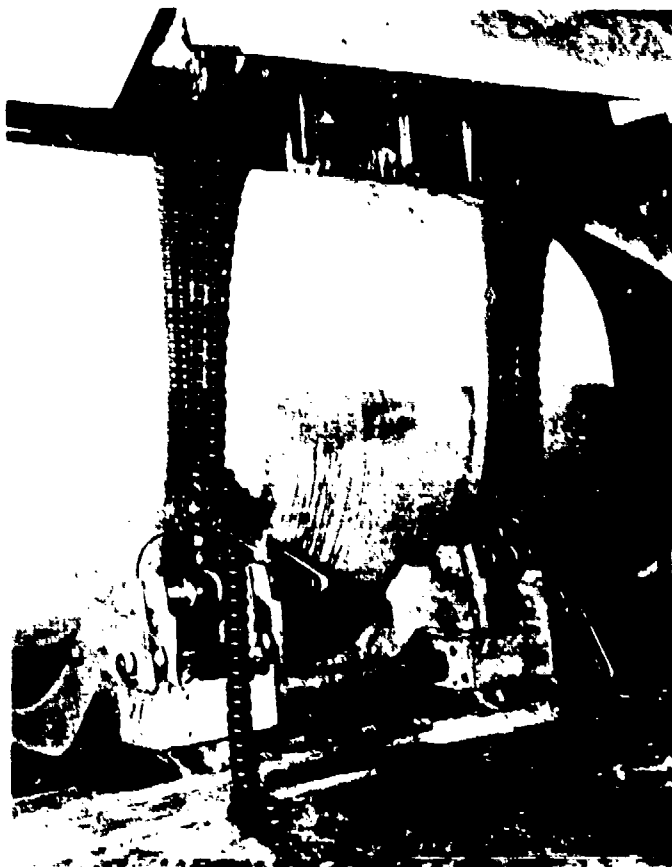
A. Bomb in position under airplane ready for loading.

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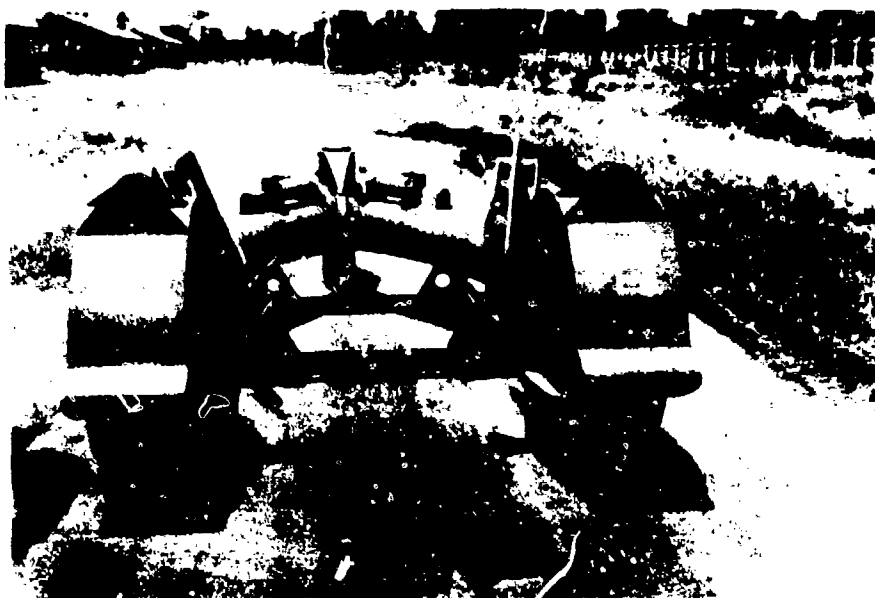
B. Chain hoists attached and sling chains in position prior to lifting.

Inclosure 12, Page 2.

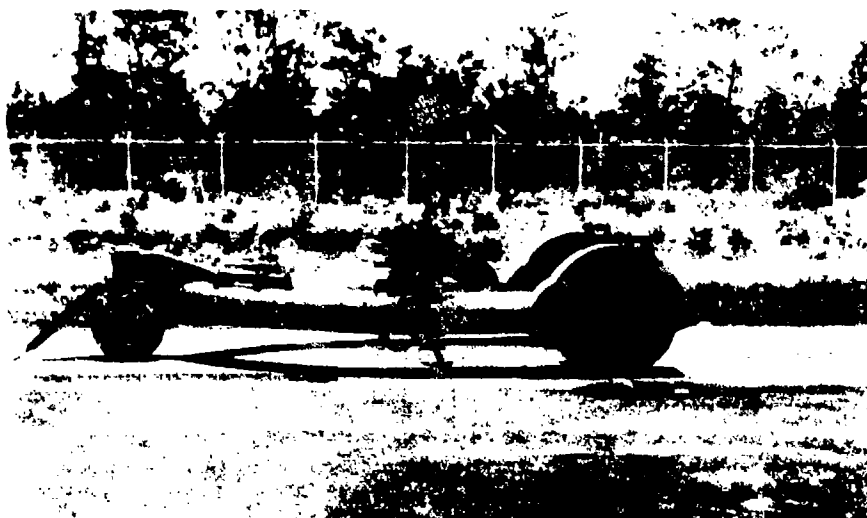
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A. Rear view of Boeing trailer, showing support assemblies for road use.



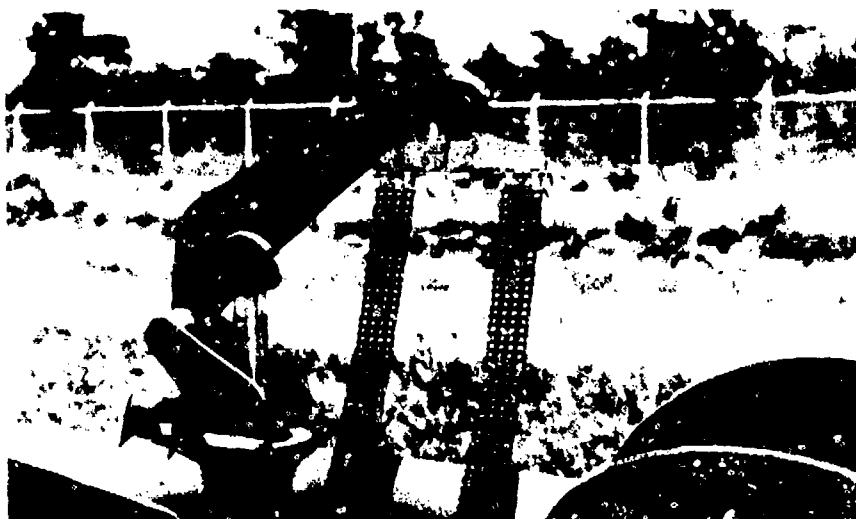
B. Side view of Boeing trailer.

Inclosure 13, Page 1.

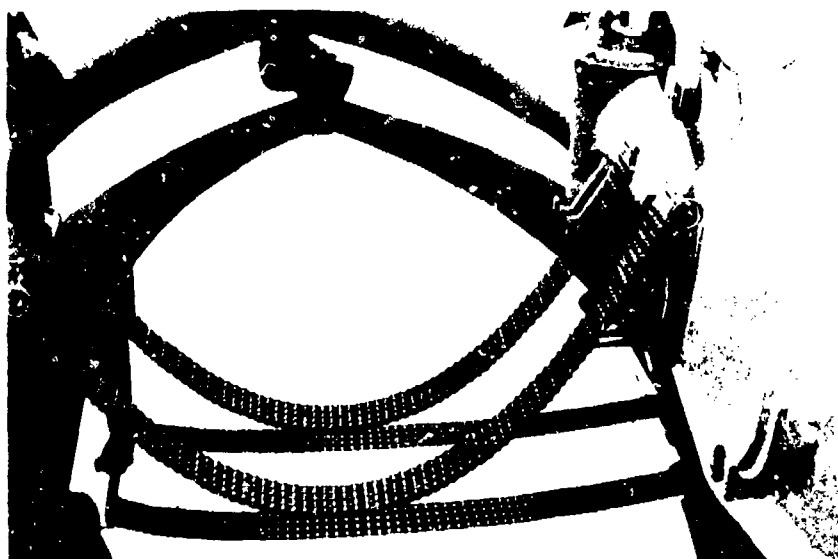
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C. Hydraulic arm of Boeing trailer at optimum lift.



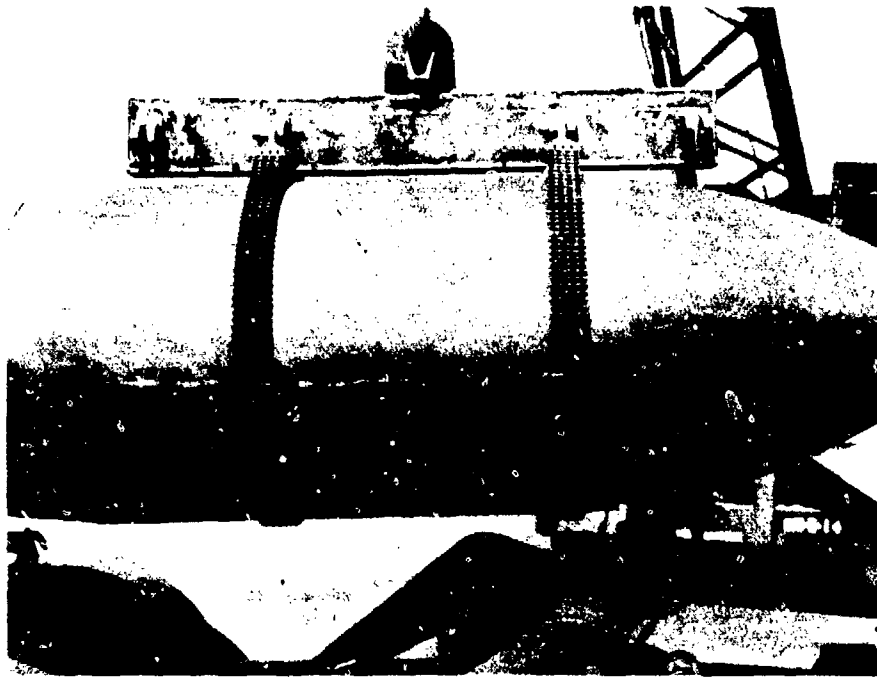
D. Chain used to lift 12,000 and 22,000-pound bomb on Boeing trailer.

Inclosure 13, Page 2.

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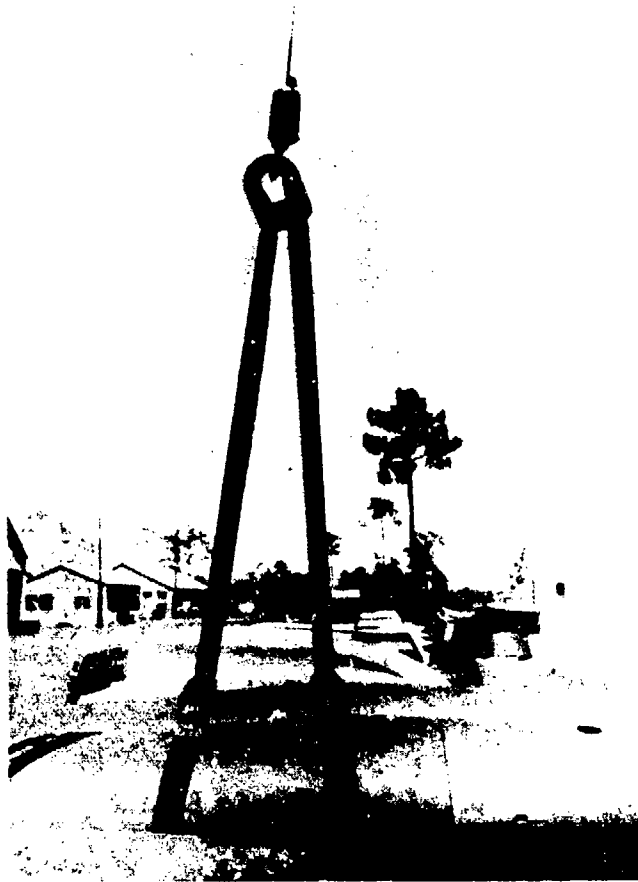
- A. First lifting bar and sling as developed at this station. Outer rings are for placement of sling with 22,000-pound bomb.

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B. "V" type lifting bar and sling on 12,000-pound bomb.

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INCLOSURE 15

**Copy of Telegram to Hq AAF
dtd 30 July 1945**

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Date: 30 July 1945

Office of origin: AAF Proof Division, Testing Branch, Eglin Field.

TO: COMMANDING GENERAL, AAF, WASH 25, D.C.

ATTN: LT. COL. G. E. CRANSTON, OC&R.

PG 1034. REF BOEING WICHITA BOMB LIFT TRAILER FOR LARGE BOMBS, THE FOLLOWING CHANGES MUST BE MADE BEFORE TRAILER IS SATISFACTORY.

1. OVERALL LIFT BE INCREASED TEN INCHES.
2. MECHANICAL LOCKS BE INSTALLED ON HYDRAULIC PISTONS TO PREVENT COLLAPSE IN CASE OF HYDRAULIC FAILURE.
3. LIFTING ARMS BE INSTALLED WITH TOP THRUST AND BOTTOM SIDE THRUST BEARINGS TO ENABLE BOMBS TO BE ADJUSTED Laterally BY MEANS OF RATCHET SCREW ADJUSTMENT TO PIVOT RAM ASSEMBLIES.
4. ROUTE HYDRAULIC LINES THROUGH METAL CONDUITS TO RAM CYLINDER SO LINES DO NOT PROTRUDE LOWER THAN FRAME OF TRAILER.
5. INSTALL LARGER PUMPING UNITS WITH MORE OIL RESERVOIR TO TAKE CARE OF LONGER LIFT.
6. LOWER FRONT CASTER WHEEL ASSEMBLY ENOUGH TO CLEAR RADAR DOME OF PRODUCTION AIRPLANE. THIS WILL BE APPROXIMATELY FOUR INCHES LOWER.
7. PROVIDE TOWING HOOKS ON FRONT AND REAR OF VEHICLE FOR ATTACHING WINCH LINES.
8. PROVIDE WHEEL BRAKES TO LOCK TRAILER IN PLACE.
9. PROVIDE MEANS OF LOCKING LIFT ARMS IN PLACE DURING EMPTY TRANSPORT OF TRAILER.

C O P Y

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10. PROVIDE A MORE SENSITIVE SHUT-OFF CONTROL VALVE TO ALLOW A GRADUAL DESCENT OF HYDRAULIC UNITS WHEN NEEDED.

11. INSTALL BLEED PLUGS ON HYDRAULIC PUMPS. INSTRUCTIONS FOR USE OF BLEED PLUGS BE STENCILED ON SIDE OF PUMP HOUSING.

12. STENCIL METHOD OF LOADING EACH TYPE OF BOMB, WITH CHANGES OF CHAIN LENGTHS AND HYDRAULIC JACK RANGE, ON SIDE OF UNIT.

13. REPLACE COPPER GASKETS ON VALVE PIN SEALS WITH AN 6227-7 TYPE O-PACKING RINGS.

14. ISSUE A COMPLETE REPAIR KIT WITH EACH UNIT, INCLUDING NEW SEALS, GASKETS AND A FILLER PUMP FOR FILLING OIL RESERVOIR. INSTRUCTIONS FOR USING FILLER PUMP BE STENCILED ON OIL RESERVOIR.

FOR WING LOADING THE UNIT MAY BE OPERATED ON REGULAR HARDSTAND SURFACING. FOR INTERNAL LOADING A CONCRETE FLOORED PIT SIXTEEN INCHES IN DEPTH, NINE FEET IN WIDTH AND APPROX FIFTY FEET IN LENGTH WITH A RAMP ON BOTH ENDS IS REQUIRED. END

WHITELEY,
CO AFPGC

LLOYD H. WATREE,
Colonel, Air Corps,
Dir, Proof Division.

Inclosure 15, Page 2.

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HEADQUARTERS
AIR PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

PROJECT DISTRIBUTION LIST

PROJECT NO.: 3-45-34

TEST OF CRANES AND TRANSPORT EQUIPMENT TO HANDLE HEAVY BOMBS.

	<u>Quantity</u>
APGC Control Office, AC/AS-3	12
Proof Test Division Files	2
Naval Liaison Office, APGC	1
APGC Liaison Officer, AMC	1
CG, AMC Area - B	6
Hq, AAF Library	2
Aero Pub Officer, NAS, Patuxent	2
CO, AAF, Watson Laboratory	1
Army Ground Forces - ATTN: Gen. Doyle	1
Hq, Marine Corps	1
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Dep. Chief, Naval Oper. (Air) Op-517	1
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CG, Air Defense Command	3
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CG, AAF, Washington 25, D.C. ATTN: Air Ordnance Officer	1

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CADO CONTROL NO:

US CLASSIFICATION:

T NO:

OA NO:

9-4-512

52590

PR-3-45-34-E4E

TITLE:

52

Preliminary Report on Test of Cranes and Transport

Equipment to Handle Heavy Bombs

AUTHOR(S):

Knobloch, R.A.

ORIGINATING AGENCY:

Proving Ground Command, Eglin Field, Fla.

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UNCLASSIFIED per authority of Commander, APGC dated 1 July 1954.
(Ref: letter from APGC dated 1 July) (14 Oct 54)



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

JUN 23 2000

MEMORANDUM FOR DTIC/OCQ (ZENA ROGERS)

8725 JOHN J. KINGMAN ROAD, SUITE 0944
FORT BELVOIR VA 22060-6218

FROM: HQ AFMC/SCDP

4225 Logistics Avenue, Room A112
Wright-Patterson AFB OH 45433-5744

SUBJECT: Technical Reports Cleared for Public Release

1. The attached HQ AFMC/PAX 1st Ind, 21 Jun 00, clears the following reports for public release in accordance with AFI 35-101, 1 Dec 99, *Public Affairs Policies and Procedures* (Case AFMC 00-124).

- ADB972848
- ADB180373

2. Please direct further questions to Lezora U. Nobles, HQ AFMC/SCDP, DSN 787-8583.

A handwritten signature in cursive script, reading "Lezora U. Nobles", is positioned above the typed name.

LEZORA U. NOBLES
AFMC STINFO Assistant
Directorate of Communications and Information

Attachment:

HQ AFMC/PAX 1st Ind, 21 Jun 00, w/2 Atch